

*Sympotthastia* Pagast (Diptera: Chironomidae), an  
Update Based on Larvae from North Carolina,  
*S. diastena* (Sublette) comb. n.,  
and Other Nearctic Species

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**ABSTRACT.**— Chironomids from the Nearctic believed to belong to *Sympotthastia* Pagast have been verified. They have been described and keyed against the well-known Palaearctic species. Generic descriptions of the male imago and pupa are expanded to include these species. Species found in the Nearctic in the larval stage, *S. fulva* Johannsen, a species near *fulva*, and *S. zavreli* Pagast, are contrasted with a generic larval description. The nearctic *S. diastena* (Sublette) comb. n., known only in the adult stage, is redescribed using two imagos collected in Oregon.

## INTRODUCTION

This paper offers a taxonomic and ecological summary of all known species of *Sympotthastia*, which should be identifiable using the generic descriptions and keys provided. Species are separable only by minor differences, but two species groups are discernable.

The Palaearctic *S. zavreli*-group consists of *S. zavreli* Pagast, *S. spinifera* Serra-Tosio, and *S. macrocera* Serra-Tosio. Most of these species are well described in all stages (Serra-Tosio 1971, Ferrarese and Rossaro 1981). An unassociated larva found in North Carolina is keyed and described herein as *zavreli* (cf. Thienemann 1952), and this is the only member of the *zavreli*-group to be found in the Nearctic.

The Nearctic *S. fulva*-group consists of *S. fulva* (Johannsen), *S. diastena* (Sublette), a species near *fulva*, known in the larval stage, and a pupa described by Saether (1969).

*Sympotthastia fulva* was described at all stages by Johannsen (1921, 1937) with an emended description of the adults by Sublette (1967). I believe that this species is properly placed because the imagoes of both sexes were described from associations with the immatures reviewed for this paper. Dr. Dean Hansen identified two slides of male imagoes as *S. diastena*. This is a new combination with which I concur;

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see its new description below. The holotype was poorly mounted and much smaller and less setiferous than these finds of Hansen, but the phallapodeme unmistakably belongs to *Sympotthastia*. Following the criteria of Serra-Tosio (1971), an attempt was made to diagram the male imagoes of *Sympotthastia* in their phylogenetic order (Fig. 14).

Terminology used in my keys and descriptions follows Saether (1980), but Saether did not illustrate a Diamesini. Several terms used for parts of the male hypopygium were seemingly interchangeable, namely superior volsella and aedeagus. I decided to use his term, superior volsella (SVo), to describe the anteromedial portion of the phallapodeme that is apodemal in nature, that is, this structure is heavily sclerotized and articulates with the sternapodeme. This is illustrated for the Protanypini (Saether 1980:Fig. 13), but I think this structure should be consistently present in some form or another in all Diamesinae. The putative aedeagus is only a flaring of the lower phallapodeme in the Orthoclaadiinae (Saether 1980:Fig. 16). Saether, however, changed his terminology to aedeagus sensu Hansen and Cook (1976) for most of the Diamesini. Aedeagus, or a penislike, intromittent structure, is present as a secondary, microsetigerous lobe of the phallapodeme in most of the species of the sister genera *Potthastia* and *Sympotthastia*. It seems proper to refer to this lobe of the phallapodeme as the median volsella (MVo). The Diamesini have an anteromedial, hirsute lobe, which may not be very well expressed, on the gonocoxite resembling that of Saether (1980:Fig. 16). This report uses Saether's term, inferior volsella (IVo) for this lobe such as it exists in *Sympotthastia* (see Fig. 12).

The following ratios are expressed in key as percentages:

Leg ratio = first tarsomere/ tibia;

Palp to face = lengths of palpal segments 2-5/ facial width at eyes;

Venarum ratio = length of cubital vein (from the arculus to its fork)/ length of medial vein.

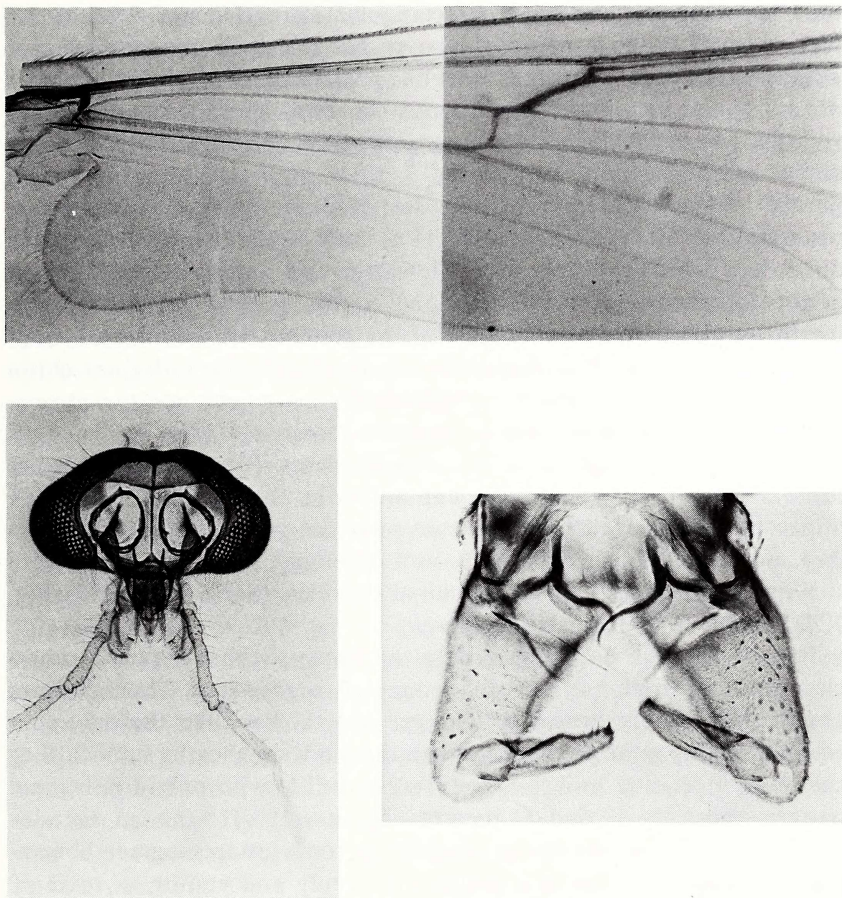
### *Sympotthastia* Pagast

*Sympotthastia* Pagast, 1947:457, type species, *S. zavreli* Pagast, orig. design.; Serra-Tosio, 1968:129-130 and 1971:267-268 (descriptions of adults and pupae).

*Diamesa heterodentata* Botn. et C.-Cure(?), Pankratova, 1970 (incomplete larval description but spoonlike premandible possessing lateral teeth).

*Nec* *Symp.* sp. Simpson and Bode, 1980:30 (= *P. gaedii* Mg.).

*Male*.— Color uniform and dark. Wing 3-4 mm; body 3-6 mm. Eye naked between lenses (X400) and reniform. Antenna with 13 plumose flagellomeres; AR usually 2-3; A<sub>13</sub> relatively long and slightly swollen apically below the subterminal spine. Postorbital setae biserial at mid-



Figs. 1-3. *Symptothastia diastena* from Oregon: 1, wing; 2, head showing endoskeleton; 3, hypopygium showing endoskeleton.

eye; outer verticals few, extending only to top of eye; inner verticals and orbital setae absent. Clypeal setae 0-15. Palpal length less than width of face; second and third segment partially fused (Fig. 2). Anteprenotum with medial commissure closed under scutal process (i.e., anteprenotal halves not gaping) and only lateral setae present. Acrostichals absent. Dorsocentrals usually uniserial at mid-thorax but otherwise multi-serial. Prealar with some setae forward and free of main cluster. Scutellar setae numerous. Wing macrotrichia on cells absent but punctations gross and visible at X400; setae on  $R_{4+5}$  usually absent; anal lobe rounded; squama setae dark; alula without setae; venarum ratio 0.87-0.90. Spiniform setae of legs present only on 1st and 2nd tarsomere (ta) of  $P_2$  and  $P_3$ ; other leg setae finer.  $Ta_4$  cylindrical and shorter or longer



than  $ta_5$ . Hypopygium with a rectangular sternapodeme. Sternite IX with a small tubercle protruding over base of each gonocoxite; anal point (AnP) absent or a small, awl-like protrusion of tergite IX which is not supported by oblique tergal apodemes. Pars ventralis small. Median volsella (MVo) clavate and setigerous; superior volsella (SVo) a strongly sclerotized and curving band (Figs. 3, 12). Gonocoxite tapering, nearly parallel sided, with longish setae scattered on the lower two-thirds; proximal half of inferior volsella (IVo) with a pile of microtrichia and distal half with short, perpendicular setae and ending slightly free of gonocoxite; and a second medial 'lobe' covered with short setae extending the length of the middle third of the gonocoxite. Gonostylus tubular, pubescent and with a few setae distally, terminally with thick chitin surrounding its face below the perpendicular macroseta, and two strong, perpendicular setae stand just proximal to macroseta (Figs. 3, 7).

*Female*.— Antenna with six flagellomeres (first two somewhat fused). Alula of wing with setae and anal lobe not rounded. Tergite IX apparently large, segment X without setae, lateral parts darkly sclerotized, postgenital plate apparently well developed, cerci hexagonal with subequal sides, and three oval seminal capsules. (Serra-Tosio 1971:Fig. 124; Saether 1977, based on *S. zavreli*).

*Pupa*.— Length 5-7 mm. Frontal apotome without cephalic tubercles, but long frontal seta arising from each rugose spot. Thoracic horn absent. Middle precorneal seta longer and thicker than the two, subequal, flanking setae. Thoracic, antennal and wing sheaths smooth. Leg sheath of  $P_3$  ending in a Z-curve. Tergite I (T1) with only a polygonal pattern and only  $L_2$  and  $L_4$  present. Tergites II-VII with an anterior band of color only (apophyse) followed by some group shagreen bordering polygons; then spinulae dispersing evenly and ending in rows of small, triangular spines on the posterior margin; finally rows of strong, anteriorly pointing spines on conjunctiva II/III - VII/VIII (Fig. 4).  $L_2$  dorsal.  $L_{1-3}$  evenly spaced but moving toward lateroposterior on each successive segment.  $L_3$  and  $L_4$  in close proximity. L-setae usually apically forked, up to eleven branches on  $L_2$  on VII and VIII. D-setae small, dispersed, and usually simple. MD1 somewhat transverse and MD2 longitudinal. Shagreen on sternites similar to that of tergites. Segment IX with a fringe of very short setae on lateral border; each lobe having a terminal, tooth-like ventral tubercle near the last of the three straight macrosetae. Gonopodal sacs straight and not extending past caudal margin.

*Larva (4th stadium)*.— Head quadrate, rather thinly sclerotized, and color uniform luteous or darker. Mentum with a yellow or smoky, subequally trisected ventromentum (median area) that is 6-7X the width of the much darker first dorsomental (lateral) tooth; six to seven



obliquely arrayed, dark lateral teeth. Ventromental plate (VmP) present, teardrop-shaped, or absent. Antennal AR 1.5 or 2.0-2.5;  $A_2$  appearing very bifid with the blade base fused to it laterally, or appearing normal with the blade base fused to  $A_2$  nearer to the apex of  $A_1$ ; ring organ in basal fourth; blade and style elongate, reaching at least to  $A_4$ ;  $A_3$  annulate. Labrum with simple S-setae, mostly simple chaetae, and simple spinulae over premandible. SIII hairlike and SIV lanceolate. Labral lamellae (LL) two broad, simple or slightly denticulate plates. Chaeta media broad at base and sometimes frayed apically. Epipharyngeal area with a three scaled pecten flanked on each side by a pair of larger blades and several thinner spines. Premandible mitten-shaped with 1-4 inconspicuous lateral teeth on its medial, curved margin; brush spike-like lateral spine only. Mandible normal or sickle-shaped as in *Potthastia* spp. Prementum with three groups of long, flat bristles. Maxilla with a low palp and sensilla; galea without a row of lanceolate pegs. Body moderate in length (6-12 mm) and without conspicuous lateral setae even on the 10th segment (base of parapod). Procercus button-like, heavily sclerotized anally, height to width about one, and supporting seven long (about 400  $\mu$ m) anal setae (AS) and two small, unequal lateral setae. Supraanals not reduced, but shorter than anal setae. Anal tubules (TA) fingerlike, rounded or pointed apically, and shorter than parapod. Posterior parapod moderately elongate with 16 dark claws.

*Remarks.*— The adult males of *Symptothastia*, according to Serratosio (1971), is relatively plesiomorphic to *Potthastia* based on the trends of unreduced chaetotaxy and the cylindrical  $ta_4$ . Using the reduction in chaetotaxy within the genus, a phylogenetic scheme is proposed that includes the Nearctic species and that leaves *S. zavreli* the most apomorphic (Fig. 14).

*Symptothastia* is a very uniform genus in all stages, but two species groups may be separated. The *zavreli*-group is mostly Palaearctic, and the *fulva*-group is Nearctic. Adults have differences in the palpal 2nd segment, color of capitellum of haltere, and anal point. Pupae show only slight variations in chaetotaxy, and larvae have or do not have ventromental plates and have differently shaped mandibular armature. Specifics are used in the following keys. Because of this homogeneity no subgenera are proposed.

*Ecology.*— The temperate *Symptothastia* species can be found in the peneplaned or filled valleys of the foothills-piedmont within the altitude of 60 to 220 m. The small streams of these lowland valleys originate in forested hills of about 350 m altitude, and they are secondarily cutting into the floodplain, exposing rock and sand substrate. They are moderately mineralized and relatively free of silt (and pollution). Surrounding land is used for moderate agriculture, or remains forested.

Larvae can be found in crude cases in pools or in reaches with laminar flow. Their guts contain predominantly diatoms. Flight time is from March to June when water reaches 10-15°C. This ecological summary was taken from Serra-Tosio (1971), Johannsen (1937), Pagast (1947), Ferrarese and Rosaro (1981) and conversations with U.S. Geological Survey personnel and with David Lenat of the North Carolina Department of Natural Resources and Community Development.

## KEYS TO MALES, PUPAE AND LARVAE OF *SYMPOTTHASTIA*

### MALES

1. AnP awl-like, bare, 60-90  $\mu$ m long. Capitellum dusky. Palpal 3d segment without a keel of dark setae (*fulva*-gp.).....2
- AnP absent or conical, hairy and one or two spines apically (Figs. 9-11). Capitellum clear. Palpal 3d segment expanded bearing a keel of dark setae (*zavreli*-gp.).....3
2. AR 2.4-2.6;  $A_{13}$  800  $\mu$ m long. LR 73, 49, 53;  $P_3$  with  $ta_4$  110  $\mu$ m and shorter than  $ta_5$ . Palpal length 500  $\mu$ m; palp to face about 85. Clypeal setae about 15. SVo straight distally (Fig. 13). Body and wing about 3 mm ..... *S. fulva* (Joh.)
- AR 2.7-2.9;  $A_{13}$  995  $\mu$ m long. LR 88, 54, 52;  $P_3$  with  $ta_4$  170  $\mu$ m and longer than  $ta_5$ . Palpal length 850  $\mu$ m; palp to face 87-98. Clypeals 12-15. SVo sigmoid (Fig. 3). Body 5-6 mm; wing 3.6 mm .... *S. diastena* (Subl.)
3. AnP absent or minuscule and hairy. Clypeal setae absent. LR 81, 49, 59. AR 2.4-3.0;  $A_{13}$  1150  $\mu$ m long. Palp to face 67-72. VR 85-92. SVo near Fig. 12, but lacking spinulae. Body 4-6 mm; wing 3-4 mm ... *S. zavreli* Pag.
- AnP conical, hairy, and stong spine(s) apically. Clypeals present. LR 75, 52, 58 or 64. VR 87-90 .....4
4. AnP about 35  $\mu$ m long with one spine apically (Figs. 7, 9, 10). Clypeals 4 or 5. Palp to face 79-85. AR 1.6-1.8;  $A_{13}$  750  $\mu$ m long. SVo sigmoid, narrow, and smooth (Fig. 8).  $P_3$  with  $ta_4$  125  $\mu$ m long and LR 64. Body 4.3-4.8 mm; wing 3.5 mm ..... *S. spinifera* Tosio
- AnP longer with two unequal spines apically (Fig. 11). Clypeals 11. Palp to face 89. AR 3.0;  $A_{13}$  1095  $\mu$ m long. SVo band-like with fine spinulae on surface (Fig. 12).  $P_3$  with  $ta_4$  195  $\mu$ m long and LR 58. Body 5.5 mm; wing 4.3 mm ..... *S. macrocera* Tosio

### PUPAE

1. L-setae of VII-VIII subequal and not darker than those on preceding segments and  $L_2$  with 8 branches or less.  $D_4$  of III-VII larger than  $D_5$  and sometimes bifid on VII or VIII. Shagreen near apophyse of TII weakly grouped. Thoracic spiracle (bulb) without spinulae. Coloration yellow-brown with transparent-brown setae and spines, and muscle scars clear or colored (*fulva*-gp.).....2
- L-setae of VII-VIII shorter (by 1/3) and darker than those of VI and  $L_2$  with more than 8 branches.  $D_4$  of III-VII simple and subequal to  $D_5$ . Thoracic spiracle (bulb) with spinulae. Muscle scars dark (*zavreli*-gp) ...3

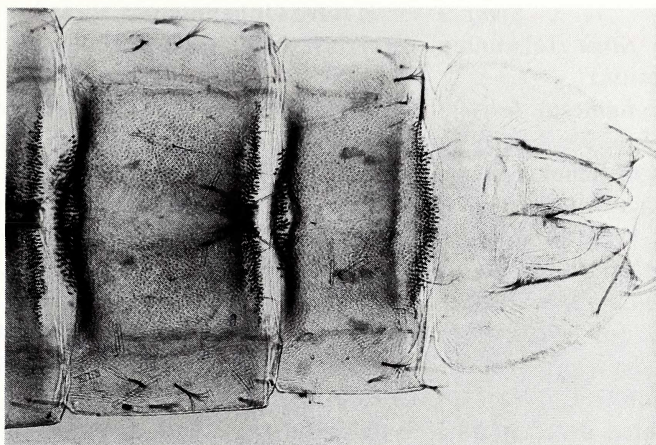


Fig. 4. *S. spinifera* from Italy, pupa. Typical of genus.

2.  $L_3$  simple or bifid on III-VI. Muscle scars dark. Few spines on conjunctiva II/III ..... *S. sp.* (Saether 1969)
- $L_3$  on II-VI simple. Muscle scars clear. Many spines on conjunctiva II/III ..... *S. fulva* (Joh.)
3.  $L_3$  on II-VI usually bifid or trifid and not much finer than the other  $L$ -setae. Macrosetae of IX subequally spaced. Shagreen near apophyse of II strongly grouped. Color pale yellow with darker areas . . . *S. zavreli* Pag.
- $L_3$  on II-VI fine and usually simple, at most bifid. Anterior macroseta of IX noticeably separate from terminal pair (Fig. 4). Shagreen near the apophyse of TII weakly grouped. Color of abdomen II-VIII clear-brown with darker spines. .... *S. spinifera* Tosio
- ..... *S. macrocera* Tosio

#### LARVAE

1. Ventromentum yellow and VmP absent. Mandible with subequal lateral teeth set in as a group. Premandible with 1-2 small lateral teeth. Blade fused to mid- $A_2$ . AS about 1.5X longer than supraanals (*fulva*-gp.) ..... 2
- Ventromentum smoky colored; VmP present, teardrop shaped. Mandible normal; lateral teeth thorn-like, individual outgrowths. Premandible with about 3 inconspicuous lateral teeth.  $A_2$  appearing less bifid as blade base is nearer to apex of  $A_1$ . AS 2X longer than supraanals (*zavreli*-gp.) ..... 3
2. AR 2.2. Head capsule with flecks of chitinous thickening. Alaskan arctic ..... *S. cf. fulva*
- AR 1.5. Head thinly sclerotized. New York ..... *S. fulva* (Joh.)
3. AR 2.5. Blade reaching  $A_5$ . Premandible dark and with 2-3 lateral teeth. Ventromentum standing above laterals. LL two nondenticulate plates ..... *S. zavreli* Pag.
- AR 2.2. Blade reaching  $A_4$ . Premandible dark and with 3-4 lateral teeth. First pair of lateral teeth projecting above ventromentum. Two LL, each with about 3 denticulations ..... *S. spinifera* Tosio



*Sympotthastia fulva* (Johannsen)

*Diamesa fulva* Johannsen, 1921:229, orig. design. (holotype female description).

*D. (Psilodiamesa) fulva* Joh., Johannsen, 1937:33-34 (description of pupa, Fig. 91; description of larva, Figs. 92-96; keys; also noted that male and female imago descriptions were associated with the immature stages); Pagast, 1947:511-512, 569 (remarked that this species lies within *Sympotthastia*; Thienemann, 1952:248 (keyed it near *Potthastia gaedii*).

*Psilodiamesa fulva* Joh., Johannsen and Townes, 1952:13.

*D. fulva* Joh., Roback, 1957:51, 53 (keys); Sublette, 1964:129-130 (color description of a female that is perhaps this species); Sublette and Sublette, 1965:276 (distribution); Sublette, 1967:480-483 (supplemented description of female and male with accurate figures of male hypopygium).

*Sympotthastia fulva* (Joh.), Saether, 1969:34 (description of a probable new species near this one); Serra-Tosio, 1971:281 (placement within genus near *S. spinifera*); and Hansen and Cook, 1976:142 (generic placement).

*Larva*.— Head yellowish and thinly sclerotized without flecks of reinforcing chitin. Mentum as described for genus; specifically, ventro-mentum yellow and VmP absent. AR 1.5;  $A_1$  length/width (ALAW)=3; antenna to mandible 6:10. Contrasted to *S. zavreli* below, the SI is shorter, wider and more blade-like; SII subequal to SIII; LL two non-denticulate plates. Premandible with 1-2 lateral teeth. Mandible as in *Potthastia* spp., i.e., somewhat sickle-shaped, toothed area dark, and four, subequal laterals set in as a group. Si with 20 finely serrated branches, proximal ones longest. Maxilla as in Johannsen (1937: Fig. 94). Body 7 mm. Procercal height/width (H/W)=0.8. Seven AS, 1.5X longer than supraanal setae. TA three-fourths the length of parapod. Posterior parapod with the nominal 16 claws (*versa* Johannsen 1937:33).

*Material*.— USA: NEW YORK, *Tompkins Co.*, Cascadilla Cr. at Cornell Univ., Ithaca. Paratype female, pinned; allotype male hypopygium and antenna and pupal and larval skin, Cornell Univ. no. 2326, slide mounted (specimens squashed), and the remainder of the pinned male was slide mounted in Euparal.

*Sympotthastia cf. fulva* (Joh.)

*Larva* (4th stadium, N=1).— Fig 6. Head rather robust, brown with flecks of heavier sclerotization. AR 2.2; blade fused nearer to base of  $A_2$  than in *fulva*, resembling *zavreli*. Body length and color indeterminate. Remaining characters identical to that of *fulva*.

*Material*.— USA: ALASKA, Happy Valley Cr. (Sagavanirktok R.



Fig. 5. *S. zavreli* from North Carolina, larval head.

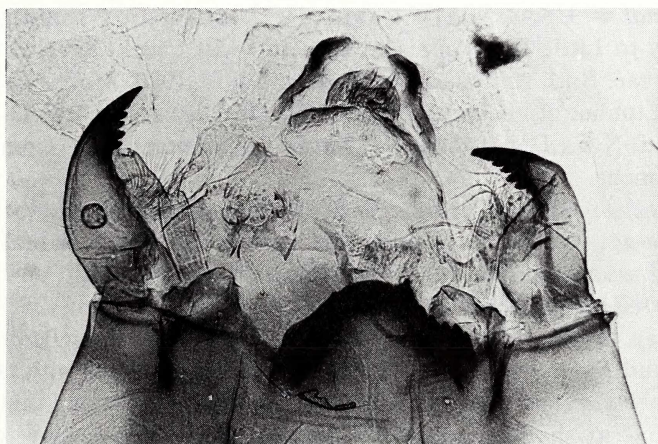


Fig. 6. *S. cf. fulva* from Alaska, larval head.

basin) nr. Sagwon, 69°09'N 148°50'W, 7 July 1976. 4th stadium larva.

*Ecology*.— This specimen was drift-netted in an arctic creek with abundant orthoclads, simuliids and baetids. The following parameters were noted for this creek a few years earlier: June - Sept. 1972, temp. to 11°C, conductance very low, pH circumneutral, alkalinity 12-18mg/l, discharge 1-1.5m<sup>3</sup>/s (Nauman and Kernodle 1973).

*Sympotthastia zavreli* Pagast

*Syndiamesa* sp. Thienemann, 1934, in the keys of Johannsen (1937) and Roback (1957).

*Sympotthastia zavreli* Pagast, 1947: 458-459 and 510-512 (description of

male with Figs. 12-15 and description of pupa); Serra-Tosio, 1968: 130-134 (redescription of male, Pl.III hypopygium); Serra-Tosio, 1971:268-274 (description of male, Pl.122 hypopygium and Pl.123.1 SVo; description of female, Pl.124 caudal section, wing, and antenna; description of pupa, Pls.125-126 abdominal segments); Pinder, 1978:44 (key and Fig. 95B of hypopygium).

*Larva* (4th stadium, N=2).— Fig. 5. Head brownish-yellow. Ventromentum smoky in color. VmP clear, teardrop shaped. Antennal AR 2.2-2.5; ALAW 4-5. Antenna to mandible 6:10. Labral S-setae all strong spines. SI subequal to SII; SIII hairlike. LL two nondenticulate plates. Premandible short and darkened distally with 2-3 inconspicuous lateral teeth. Mandible normal with each of the four lateral teeth appearing as individual outgrowths. Si with 12-17 nearly smooth branches. Body about 11 mm. Color brownish. Procercal H/W= 1.0 and AS 2X longer than supraanals. TA rounded or pointed distally and nearly half the parapod length.

*Material*.— USA: NORTH CAROLINA, *Durham Co.*, simipermanent tributary to Little R.; *Wake Co.*, trib. to Swift Creek. Several 4th stadium larvae. Both stations were sampled 5 Feb. 1980. *Moore Co.*, Deep Creek (Lumber R. basin) 9 Feb. 1982. One larva. All leg. D. Lenat; collection N.C. Department of Natural Resources and Community Development.

*Remarks*.— These Carolina specimens obviously do not belong to the *fulva*-gp. by diagnosis since this species has ventromental plates. Although unassociated, they fit no known species description but that of *S. zavreli* (cf. Thienemann 1952).

*Ecology*.— The Carolina specimens were found with *Paraphaenocladus* and *Eukiefferiella* (b.s.) in small Piedmont streams with sand and gravel substrate and slow current. Thienemann (1952) stated that *zavreli* was found in shallow, unshaded trout streams having slow current, spring runs, and meadow ditches, and that diatoms were prevalent in guts. These new Nearctic finds had consumed mostly *Synedra* and *Gomphonema*.

*Sympotthastia diastena* (Sublette) *comb. n.*

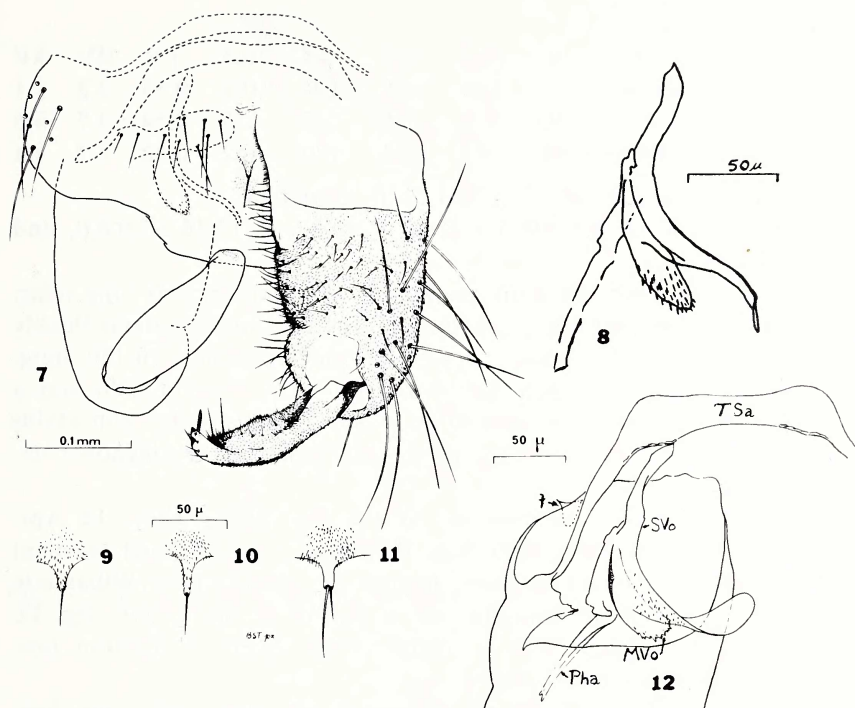
*Pseudodiamesa* (*P.*) *diastena* Sublette, 1964:128, orig. design. (Fig. 7b,c of male hypopygium and description of allotype).

*P. diastena* Sublette, Serra-Tosio, 1976:135 (stated placement questionable).

*Sympotthastia diastena* (Sublette), Dr. D. Hansen in 1973 determined two slide mounted males.

*Male* (N=2).— Figs. 1-3. The holotype was decidedly smaller than the following described specimens (measurements of holotype in paren-





Figs. 7-10. *S. spinifera* (cf. Serra-Tosio, 1971): 7, hypopygium; 8, phallapodeme; 9-10, anal point.

Figs. 11-12. *S. macrocera* (cf. Serra-Tosio, 1971): 11, anal point; 12, phallapodeme. Labels added: MVo, median volsella, Pha, phallapodeme, SVo, superior volsella, t, tubercle of SIX, and TSa, transverse sternapodeme.

theses). Unspecified lengths are in micrometers. Body length 5.7-6.0 mm (holotype 2.9 mm); wing 3.6 mm (2.9 mm). Coloration of head, body, wing veins and coxae dark; haltere dark, pubescent with capitellum somewhat lighter. Extremities of the legs and the sternites lighter.

Antennal flagellomere lengths:  $A_1$  73-80 (60):  $A_{2-12}$  24-27:  $A_{13}$  995 (880). AR 2.7-2.9.  $A_{3-12}$  width greater than length, excepting the last few which become squarish. Width of head at eyes 750-820. Clypeus with 12-15 setae proximally in a staggered double row. Palpal segment 2-5 lengths: 105 (70): 220-280 (195): 250-280 (205): 295 (230). Antepnotum with 14 lateral setae: dorsocentrals variable — staggered single to triple row of 25-30 setae (holotype with a single to double row of 22 setae); prealars with a main cluster of 15 and anteriorly 7-8 isolated setae staggering forward (holotype with only 4 or 5 isolated setae). Scutellum with numerous setae. Wing VR 0.88. One specimen with a full row of setae on  $R_{4+5}$  (Fig. 1).

Leg segment lengths:

—	fe	ti	tal	ta2	ta3	ta4	ta5	LR	BV	SV
P1	1426	1674	1472	628	426	194	163	0.88	3.2	2.1
P2	1542	1581	876	473	310	147	155	0.54	3.7	3.6
P3	1814	2030	1240	643	395	170	162	0.52	3.7	3.1

Tibial spur lengths: P<sub>1</sub> 90, P<sub>2</sub> 71 and 72, P<sub>3</sub> 62 and 96.

Spiniform setae of ta<sub>1-5</sub> often paired: P<sub>1</sub> none, P<sub>2</sub> 12-14, 2-3, 0, 0, 0, and P<sub>3</sub> 13-16, 2-5, 0, 0, 0.

Tergite IX with each half with two groups of 6-8 moderately long setae; anal point naked, awl-like, 70-90 long. Transverse sternapodeme thickly rectangular. Straight coxite portion of phallapodeme, 70-170 long, articulating with a strongly sclerotized, narrow, sigmoid SVo and a membranous, ovate, setigerous MVo (Fig. 3). Gonocoxite, gonostylus and other details typical for the genus, and found in the diagnostic description above.

*Material*.— USA: CALIFORNIA, *Marin Co.*, Mill Valley. 12 Apr. 1957. Leg. H. L. Mathis, light trap. Holotype, U.S. National Museum no. 65522 (poor mount). OREGON, *Benton Co.*, Berry Creek (Willamette R. basin), 9 mi N of Corvallis, 60 m alt. 17-24 Mar. 1960, leg. D. Hansen; det. Hansen, 1973. 2 males. Univ. Minn. Collection nos. DH69-280 and -281 (in balsam?).

*Remarks*.— The holotype of *diastena* is very near *fulva*, but these new specimens show *diastena* can be much larger and darker than *fulva*. I doubt *fulva* will be found in the western Cordilleran. The numerous dorsocentral setal rows and forward running prealars, and the unique presence of setae on R<sub>4+5</sub> (Fig. 1), demonstrate that this species is the most plesiomorphic species known in *Sympotthastia*. Its SVo is identical to *spinifera* and differs slightly from *fulva*.

The presence of a species different from *fulva* in the western Cordilleran is also demonstrated by the pupa found in Waterton National Park, Alberta, by Saether (1969) and keyed here as *Sympotthastia* sp. Also, the larva from the Alaskan arctic, *S. cf. fulva*, is separable. It may be that these unconnected metamorphic stages represent a single Cordilleran species.

#### *Sympotthastia spinifera* Serra-Tosio

*S. spinifera* Serra-Tosio, 1968:134-140, orig. design. (Figs. 1-4 of hypopygium; ecology); Serra-Tosio, 1971:224-227 (Pl. 123.2 phallapodeme; Pl. 127 hypopygium; Pls. 128-129 pupa; p. 277 ecology); Ferrarese and Rossaro, 1981:77-80 (larva description, Fig. 36 with mentum, labrum, antenna, premandible, procercus; pupal description, Fig. 37).

#### *Sympotthastia macrocera* Serra-Tosio

*S. spinifera forma macrocera* Serra-Tosio, 1968:137-138.

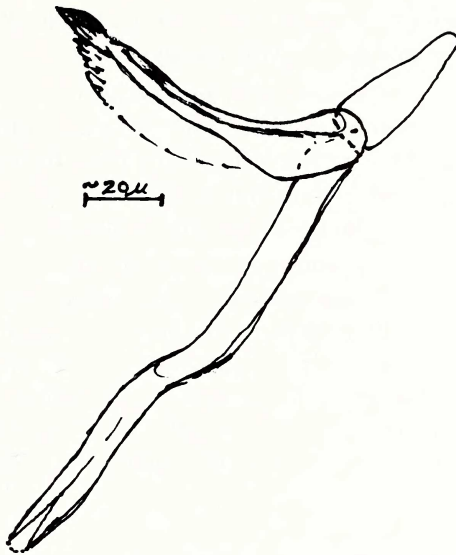


Fig. 13. *S. fulva*, phallapodeme of allotype no. 2326.

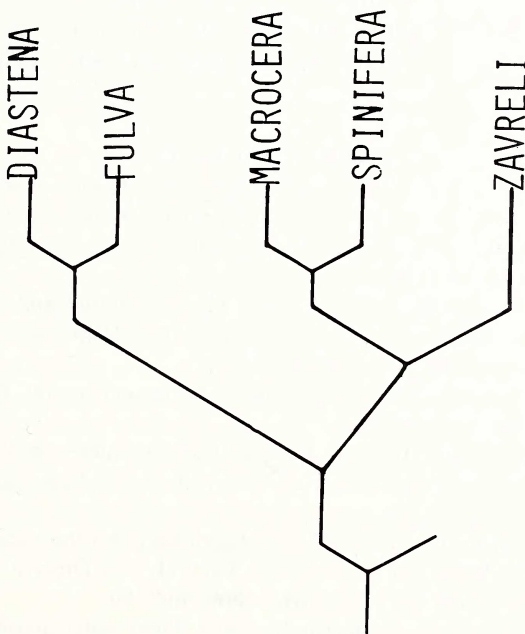


Fig. 14. Proposed cladogram of *Sympotthastia*.



*S. macrocera* Serra-Tosio, Serra-Tosio, 1971:277-280 (Pl. 130 phallapodeme, gonostylus, and  $ta_{3-5}$ ; p. 279 ecology).

*Sympotthastia* sp. Saether

The two pupal exuviae (Saether 1969:34) were examined from Dr. Saether's collection. This species differs from *fulva* by having only a few anteriorly pointing spines on conjunctiva II/III. The lengths of these specimens were about 5 mm instead of the 8 mm reported by Saether.

*Sympotthastia virendri* (Singh)

This oriental species was placed in *Sympotthastia* by Sublette and Sublette (1973). I am inclined to think this is not suitable, since Singh (1958) described the species with hairy wings, pictured wing without strong anal lobe, with acrostichals, and, in a diminutive drawing, the SVo appears to be that possessed by the *Diamesae*. The number of spermathecae was not mentioned for the female described.

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